

REMARKS

Applicant has thoroughly considered the Examiner's remarks and claims 1-5, 8-29, and 31-40 are now presented in this application for further examination. Claims 1, 9, and 16 have been amended, claims 16-20 have been canceled, and new claims 37-40 have been added by this Amendment C to more clearly set forth the invention. Claims 6 and 7 were previously canceled. Reconsideration of the application in view of the following remarks is respectfully requested.

Drawings

As a preliminary matter, Applicant respectfully requests the Examiner to indicate whether the drawings submitted on May 27, 2004 are accepted.

Claim Rejections under 35 U.S.C. § 112

Claims 1-5, 8-29, and 31-36 stand rejected under 35 USC §112 as failing to comply with the written description requirement. According to the Office, the present application "does not provide support using both capacitance sensor and resistance sensor with the same embodiment as is now claimed in claim 1."¹ The Office further asserts that the "specification only suggests the direction and speed 'may be' determined by using 'a greater number of paired electrodes' but fails to disclose exactly how this is done."² Applicant has thoroughly considered the rejection and respectfully disagrees.

Applicant notes that "adequate description under the first paragraph of 35 U.S.C. § 112 does not require **literal** (i.e., using the same terms or in *haec verba*) support for the claimed invention Rather, it is sufficient if the originally-filed disclosure would have conveyed to one having ordinary skill in the art that an [applicant] had possession of the concept of what is claimed."³ The present application provides sufficient disclosure to satisfy this requirement.

For example, the present application explains how measured changes in impedance yield distance information, i.e., the amount of separation between the data input device and the tracking surface, and that monitoring this information over time reveals speed and direction

¹ June 11, 2007 Office action, page 2.

² June 11, 2007 Office action, page 3.

³ *Ex parte Parks*, 30 USPQ2d 1234 (B.P.A.I 1994) (emphasis in original); see MPEP §2163.02.

information. "In this example, the presence of mainly air within the fringing field F (see Fig. 2) will yield a particular capacitance, because the dielectric constant of air is about one. The controller 33 will interpret such a capacitance measurement as the presence of a gap between the device 21 and the tracking surface 25. Conversely, the presence of mainly the tracking surface 25 within the fringing field F (see Fig. 2) will yield an increased capacitance because the dielectric constant of solids tend to be much greater than one. . . . The controller 33 may be tuned to interpret these capacitances as indicative of relative distances between the tracking surface 25 and the device 21, such that the distance between the device and the tracking surface is known and modes of operation of the device may be selected accordingly. In this manner, continuous capacitance measurements provide for continuous monitoring of the distance between the device 21 and the tracking surface 25, within a given working range of the device. The device 21 may further comprise a resistance-capacitance (RC) resonance circuit 53 shaped and sized to connect to the capacitance sensor for detecting capacitance changes and sending them to the controller 33, as would be readily understood by one skilled in the art."⁴ The application further states, "By detecting the time sequence of capacitance changes sensed by the paired electrodes 51, the direction and speed of relative movement between the device 21 and the tracking surface 25 may be determined during lift-off."⁵

One of ordinary skill in the art readily recognizes that the changes in the measured capacitance over time reveal whether the device and tracking surface are becoming relatively closer to each other or relatively farther apart from each other. In other words, Applicant clearly possessed, at the time of filing, the invention of a data input device that monitors changes in impedance, namely, capacitance, over time to determine a direction of relative travel. Likewise, one skilled in the art readily understands that the rate of change of the continuously monitored capacitance measurements indicates the speed of travel.

Moreover, the present application explains how these aspects of the invention can be extended to those embodiments using a resistance sensor rather than a capacitance sensor. For example, "⁶As discussed above with respect to capacitance sensing, a greater number of paired electrodes 51 may also be incorporated with resistance sensing to provide increased sensitivity and information relating to the direction and speed of relative movement between the device 21

⁴ Application, paragraph [0029].

⁵ Application, paragraph [0032].

⁶ Application, paragraph [0035].

and the tracking surface 25 during lift-off." Applicant concedes that some of the examples set forth in the application involve embodiments having two or more pairs of electrodes, used either for capacitance sensing or for resistance sensing. Nevertheless, one skilled in the art can readily ascertain from the description provided in the application how to determine direction (e.g., in the Z direction) and speed from a single pair of electrodes. This is accomplished by simply monitoring the impedance changes over time. Advantageously, the use of additional electrodes pairs yields speed and direction information in the X-Y plane in addition to in the Z direction.

With respect to claim 1, Applicant believes that the application as originally filed reasonably conveys to one of ordinary skill in the art that a single data input device could include one or more of the different types of impedance sensors. In fact, the application states, "In the several embodiments of the claimed invention, the impedance sensor 29 may be constructed to function in a variety of different ways, depending upon the desired sensing capabilities of the device 21."⁷ But to advance prosecution, Applicant has amended claim 1 to remove the reference to both a capacitance sensor and a resistance sensor. Therefore, the rejection of this claim for failure to comply with the written description requirement is rendered moot and should be withdrawn.

Moreover, amended claim 1 recites that the controller is configured to determine not only a distance of spatial separation between the data input device and the tracking surface relative to one another as a function of the measured capacitance" but also "a direction of relative movement between said data input device and said tracking surface as a function of the measured capacitance." As previously noted⁸, the cited art⁹ fails to disclose a sensor that determines the **direction of relative movement** between a data input device and a tracking surface as a function of a measured impedance. For at least these reasons, Applicant respectfully submits that amended claim 1 is patentable. Claims 2-5, 8-26, 37, and 38 depend from independent claim 1 and are believed to be allowable for at least the same reasons as claim 1.

The written description requirement is wholly distinct from the enablement requirement¹⁰ but with respect to claim 27 the Office appears to confuse the concepts by stating that the

⁷ Application, paragraph [0028].

⁸ Amendment B, pages 9 and 10.

⁹ See December 12, 2006 Office action.

¹⁰ MPEP §2163.02.

application "fails to disclose exactly how [determining direction and speed] is done."¹¹ One of ordinary skill in the art can readily recognize from the application, including the exemplary language described above, that the position of the data input device relative to the tracking surface affects the impedance between the electrodes. Moreover, continuously monitoring changes in the impedance, as measured between the electrodes, provides information about the direction of relative movement.

In light of the foregoing, Applicant submits that the originally-filed disclosure conveys to one having ordinary skill in the art that Applicant possessed the concept of claim 27. Moreover, the cited art fails to teach or suggest each and every aspect of the claimed invention, including "determining the direction of relative movement between said data input device and said tracking surface as a function of said measured impedance." Therefore, claim 27 is believed to be allowable. Claims 28 and 33-36 depend from claim 27 and are believed to be allowable for at least the same reasons.

Referring now to claim 29, Applicant submits that the as-filed disclosure of the present application supports this claim. For example, the application explains how impedance measurements, including resistance measurements, relate to spatial separation between the data input device and the tracking surface, how monitoring these impedance measurements over time yields speed and direction information, and how resistance measurements can be used in the same manner as capacitance measurements. Therefore, claim 29 reasonably conveys possession of the claimed concepts. Because claim 29 complies with the written description requirement and because the cited art fails to teach or suggest each and every claim limitation, including "determining a speed of relative movement between the data input device and the tracking surface," Applicant submits that this claim is also allowable. Claims 31, 32, 39, and 40 depend from claim 29 and are believed to be allowable for at least the same reasons.

In view of the amendments and remarks above, Applicant request that the Office withdraw the rejection under 35 U.S.C. §112, first paragraph and allow claims 1-5, 8-29, and 31-40. Should the Examiner maintain the rejections of these claims on these grounds in the next Office action, Applicant request that the Examiner provide detailed evidence or reasons why

¹¹ June 11, 2007 Office action, page 3.

persons skilled in the art would not recognize in the disclosure a description of the invention defined by these claims.

It is believed that no fees are due in connection with this Amendment C. If however, the Commissioner determines a fee is due, the Office is hereby authorized to charge said government fees to Deposit Account No. 19-1345.

Applicant wishes to expedite prosecution of this application. If the Examiner deems the claims not in condition for allowance, the Examiner is invited and encouraged to telephone the undersigned to discuss making an Examiner's amendment to place the claims in condition for allowance.

Respectfully submitted,

/Frank R. Agovino/

Frank R. Agovino, Reg. No. 27,416 for
Robert M. Bain, Reg. No. 36,736
SENNIGER POWERS
One Metropolitan Square, 16th Floor
St. Louis, Missouri 63102
(314) 231-5400